REMARKS

Claims 1, 119-120, 122, 124-125, 127-129, 131-134, and 136-153 are pending in the application. Support for the amendments to claims 1 and 132 can be found throughout the Specification, and serve to merely clarify the presently claimed invention. Support for the newly added claims 144-153 can be found at paragraphs [0054] and [0059] in application publication no. 2005/0053964. No new matter has been added to the application.

Interview With Examiner

Applicant's representative thanks the Examiner for courtesies extended during the interview held on December 14, 2010. Substantial progress toward allowance of the application is believed to have been made after the inventor presented technical differences between the prior art references and the present invention.

Claim Objections

Claim 135 has been objected to as being a substantial duplicate of claim 120. Claim 135 has been canceled. Therefore, it is believed that this objection has been overcome.

Rejection Under 35 U.S.C. §102(a), as being anticipated by Demers (Anal. Chem. 72(22):5535-5541, 2000)

Claims 1, 119-120, 125, and 135 have been rejected under 35 U.S.C. §102(a) as being anticipated by Demers. Applicant traverses this rejection. Reconsideration and withdrawal thereof are respectfully requested. Claim 1 has been amended to include the subject matter of claim 121 directed to using self-assembled monolayer to connect the protein to the colloid particle, which was not subject to rejection. Therefore, it is believed that this rejection has been overcome.

Rejection Under 35 U.S.C. §103(a), as being unpatentable over Demers (Anal. Chem. 72(22):5535-5541, 2000) in view of Bamdad '839 (WO 98/31839)

Claims 1, 119-122, and 124 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Demers in view of Bamdad '839. Applicant traverses this rejection. Reconsideration and withdrawal thereof are respectfully requested.

Demers

Demers discloses making a hybrid molecule with DNA on one end linked to carbon chain sulfur, and allowing the hybrid molecule to immobilize on a gold nanoparticle. Demers then discloses determining how many DNA oligonucleotides can fit on a nanoparticle by reacting the species bound on the nanoparticle with beta mercaptoethanol, wherein sulfur competes for binding to the nanoparticle with oligo thiol and then the fluorescence on the oligo thiol is measured to determine how many DNA oligonucleotides were accumulated on the nanoparticle. However, Demers fails to disclose any protein binding species placed on a different part of the common colloid particle that will participate in an interaction as in the presently claimed invention.

Bamdad '839

Bamdad '839 discloses a method of immobilizing biomolecules on a planar surface. Bamdad '839 discloses using surface plasmon resonance (SPR) to detect and analyze thin layers of material on a gold planar surface. Indeed, all of the examples at pages 40 to 64 are directed to making SPR type planar surfaces or chips on which are immobilized biological molecules. Bamdad '839 fails to disclose or suggest using colloidal molecules.

In view of the fact that experimental results obtained on planar surfaces cannot be predictive of results of using colloid particles, Applicants submit that Demers and Bamdad '839 fail to be combinable with each other, as a reference that discloses results on planar surfaces cannot be combined Demers, which discloses simply a nanoparticle with a DNA oligo connected to it. Therefore, the presently claimed invention is not obvious over the cited references.

Rejection Under 35 U.S.C. §103(a), as being unpatentable over Demers (Anal. Chem. 72(22):5535-5541, 2000) in view of Dower '603, (USP 5,639,603)

Claims 1, 119-122, 124-125, 128, 133, and 135-137 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Demers in view of Dower '603. Applicant traverses this rejection. Reconsideration and withdrawal thereof are respectfully requested.

Demers is discussed above.

Dower '603

Dower discloses step-wise synthesis of biomolecule on a solid support on which a drug or the test component is built, including a peptide or a small molecule. The Dower

reference is directed to improving efficiency of coupling reactions (page 4). However, Dower fails to disclose or suggest carrying out a colloid particle protein interaction reaction, and therefore, fails to remedy the deficiencies in the Demers reference. Accordingly, the presently claimed invention is not obvious over the cited references.

Rejection Under 35 U.S.C. §103(a), as being unpatentable over Burmer '149 (WO 99/45149) in view of Still '324 (USP 5,565,324)

Claims 1, 125, 127, 132-134, 136, 137, and 141-143 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Burmer '149 in view of Still '324. Applicant traverses this rejection. Reconsideration and withdrawal thereof are respectfully requested.

Burmer '149

Burmer '149 discloses making a hybrid DNA/protein molecule on a bead. Burmer '149 fails to disclose using a colloid particle in a method according the presently claimed invention, in which a protein is connected to a colloid particle via SAM, and identifier DNA is also connected to the colloid particle on a different part of the colloid particle to determine the interaction of the protein with another species.

Still '324

Still '324 discloses combinatorial synthesis. Still '324 discloses a method of synthesizing small molecules or peptides on a bead.

Applicant submits that both of the Burmer '149 and Still '324 references are directed to step by step building of either a hybrid DNA/protein molecule or some other type of molecule on a bead. Neither Burmer '149 nor Still '324 discloses or suggests using colloid particle as a surface on which to place a single sequence identifier oligonucleotide and a protein on a common colloid surface on different part of the colloid particle.

Applicant submits that the surface chemistry of a bead as disclosed in the Burmer '149 and Still '324 references is different from the surface chemistry of a nanoparticle such as a colloid. In addition, beads are "heavy" and therefore sink to the bottom of a reaction chamber. In contrast, a fluid suspendable nanoparticle, such as a colloid as in the presently claimed invention is not weighed down by gravity, which allows for a different type of chemical reaction to occur, which cannot be predicted from studies with beads. Moreover, the protein species taking part in the biological or chemical interaction can be either covalently coupled to the colloid particle or through an affinity interaction on a self-assembled

monolayer, which none of the prior art references discloses or suggests. In this regard, Still '324 fails to remedy the deficiencies of Burmer '149 in failing to disclose or suggest immobilizing a protein and a single sequence identifier oligonucleotide on a common colloid particle through self-assembled monolayer. Accordingly, the presently claimed invention is not obvious over the cited references.

Rejection Under 35 U.S.C. §103(a), as being unpatentable over Burmer '149 (WO 99/45149) in view of Still '324 (USP 5,565,324) and further in view of Dower '603, (USP 5,639,603) and Bamdad '839 (WO 98/31839)

Claims 1, 119-122, 124-125, 127-129, and 131-143 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Burmer '149 in view of Still '324 and further in view of Dower '603 and Bamdad '839. Applicant traverses this rejection. Reconsideration and withdrawal thereof are respectfully requested.

Burmer '149 is discussed above.

Still '324 is discussed above.

Dower '603 is discussed above.

Bamdad '839 is discussed above.

Applicant asserts that none of these references alone or in combination arrive at the presently claimed invention. The Burmer '149, Still '324 and Dower '603 references disclose carrying out a synthesis reaction on beads. Bamdad '839 discloses carrying out a reaction on the gold surface of planar substrates and using surface plasmon resonance (SPR) to detect and analyze thin layers of material. None of these references discloses or suggests immobilizing a protein and a single sequence identifier oligonucleotide on a common colloid particle through self-assembled monolayer. Accordingly, the presently claimed invention is not obvious over the cited references.

Conclusion

It is believed that the application is now in condition for allowance. Applicants request the Examiner to issue a notice of Allowance in due course. The Examiner is encouraged to contact the undersigned to further the prosecution of the present invention.

The Commissioner is authorized to charge JHK Law's Deposit Account No. **502486** for any fees required under 37 CFR § 1.16 and 1.17 and to credit any overpayment to said Deposit Account No. **502486**.

Respectfully submitted,

JHK Law

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